

Amendments to the Claims

The following listing of claims will replace all prior version and listing of claims in the application:

1-56. (Canceled)

57. (New) isolated nucleic acid encoding an insect gustatory receptor protein, wherein the receptor protein comprises seven transmembrane domains and a C-terminal domain, and the C-terminal domain comprises consecutive amino acids having the following sequence:

-G-L/F-F-X-X-X-X-X-X-X-X-X-X-X-X-X-T-Y-L-V/I-L-V/I/L-Q-F-
(SEQ ID NO: 60),

where X is any amino acid, and / means or.

58. (New) An isolated nucleic acid encoding an insect odorant receptor protein, wherein the receptor protein comprises seven transmembrane domains and a C-terminal domain, and the C-terminal domain comprises consecutive amino acids having the following sequence:

-G-L/F-F-X-X-X-X-X-X-X-X-X-X-X-X-X-T-Y-L-V/I-L-V/I/L-Q-F-
(SEQ ID NO: 60),

where X is any amino acid, and / means or.

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59. (New) An isolated nucleic acid encoding an insect gustatory receptor protein, wherein the nucleic acid molecule encodes a protein selected from the group consisting of:

- (a) an insect receptor protein comprising consecutive amino acids having a sequence identical to that set forth for Gr2B1 in SEQ ID NO: 1,
- (b) an insect receptor protein comprising consecutive amino acids having a sequence identical to that set forth for Gr8D1 in SEQ ID NO: 2,
- (c) an insect receptor protein comprising consecutive amino acids having a sequence identical to that set forth for Gr10B1 in SEQ ID NO: 3,
- (d) an insect receptor protein comprising consecutive amino acids having a sequence identical to that set forth for Gr10B2 in SEQ ID NO: 4,
- (e) an insect receptor protein comprising consecutive amino acids having a sequence identical to that set forth for Gr28A2 in SEQ ID NO: 5,
- (f) an insect receptor protein comprising consecutive amino acids having a sequence identical to that set forth for Gr28A4 in SEQ ID NO: 6,
- (g) an insect receptor protein comprising consecutive amino acids having a sequence identical to that set forth for

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Gr33C1 in SEQ ID NO: 7,

- (h) an insect receptor protein comprising consecutive amino acids having a sequence identical to that set forth for Gr36B2 in SEQ ID NO: 8,
- (i) an insect receptor protein comprising consecutive amino acids having a sequence identical to that set forth for Gr36B3 in SEQ ID NO: 9,
- (j) an insect receptor protein comprising consecutive amino acids having a sequence identical to that set forth for Gr59C1 in SEQ ID NO: 10,
- (k) an insect receptor protein comprising consecutive amino acids having a sequence identical to that set forth for Gr61D1 in SEQ ID NO: 11,
- (l) an insect receptor protein comprising consecutive amino acids having a sequence identical to that set forth for Gr63F1 in SEQ ID NO: 12,
- (m) an insect receptor protein comprising consecutive amino acids having a sequence identical to that set forth for Gr64A2 in SEQ ID NO: 13,
- (n) an insect receptor protein comprising consecutive amino acids having a sequence identical to that set forth for GR64A3 in SEQ ID NO: 14,

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- (o) an insect receptor protein comprising consecutive amino acids having a sequence identical to that set forth for Gr66C1 in SEQ ID NO: 15,
- (p) an insect receptor protein comprising consecutive amino acids having a sequence identical to that set forth for Gr92D1 in SEQ ID NO: 16,
- (q) an insect receptor protein comprising consecutive amino acids having a sequence identical to that set forth for Gr98A1 in SEQ ID NO: 17,
- (r) an insect receptor protein comprising consecutive amino acids having a sequence identical to that set forth for Gr98A2 in SEQ ID NO: 18,
- (s) an insect receptor protein comprising consecutive amino acids having a sequence identical to that set forth for Gr2940.1 in SEQ ID NO: 19,
- (t) an insect receptor protein comprising consecutive amino acids having a sequence identical to that set forth for Gr2940.2 in SEQ ID NO: 20,
- (u) an insect receptor protein comprising consecutive amino acids having a sequence identical to that set forth for Gr2940.3 in SEQ ID NO: 21,
- (v) an insect receptor protein comprising consecutive amino acids having a sequence identical to that set forth for

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Gr2940.4 in SEQ ID NO: 22,

- (w) an insect receptor protein comprising consecutive amino acids having a sequence identical to that set forth for Gr2940.5 in SEQ ID NO: 23,
- (x) an insect receptor protein comprising consecutive amino acids having a sequence identical to that set forth for Gr57B1 in SEQ ID NO: 46,
- (y) an insect receptor protein comprising consecutive amino acids having a sequence identical to that set forth for Gr93F1 in SEQ ID NO: 48,
- (z) an insect receptor protein comprising consecutive amino acids having a sequence identical to that set forth for Gr93F2 in SEQ ID NO: 49,
- (aa) an insect receptor protein comprising consecutive amino acids having a sequence identical to that set forth for Gr93F3 in SEQ ID NO: 50,
- (bb) an insect receptor protein comprising consecutive amino acids having a sequence identical to that set forth for Gr93F4 in SEQ ID NO: 51,
- (cc) an insect receptor protein comprising consecutive amino acids having a sequence identical to that set forth for Gr94E1 in SEQ ID NO: 52,

- (dd) an insect receptor protein comprising consecutive amino acids having a sequence identical to that set forth for Gr93D1 in SEQ ID NO: 53,
- (ee) an insect receptor protein comprising consecutive amino acids having a sequence identical to that set forth for GrLU1=Gr36B1 in SEQ ID NO: 55,
- (ff) an insect receptor protein comprising consecutive amino acids having a sequence identical to that set forth for GrLU2=Gr28A3 in SEQ ID NO: 56,
- (gg) an insect receptor protein comprising consecutive amino acids having a sequence identical to that set forth for GrLU3=Gr64A1 in SEQ ID NO: 57,
- (hh) an insect receptor protein comprising consecutive amino acids having a sequence identical to that set forth for GrLU7=Gr5A1 in SEQ ID NO: 59, and
- (ii) an insect gustatory receptor protein which shares from 7-50% amino acid identity with any one of the proteins of (a)-(hh), and comprises seven transmembrane domains and a C-terminal domain, wherein the C-terminal domain comprises consecutive amino acids having the following sequence:

-G-L/F-F-X-X-X-X-X-X-X-X-X-X-X-X-X-T-Y-L-V/I-L-V/I/L-Q-F- (SEQ ID NO: 60),

where X is any amino acid, and / means or.

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60. (New) The isolated nucleic acid of claim 57, 58 or 59, wherein the nucleic acid is DNA or RNA.
61. (New) The isolated nucleic acid of claim 60, wherein the DNA is cDNA, genomic DNA or synthetic DNA.
62. (New) The isolated nucleic acid of claim 57, 58 or 59, wherein the nucleic acid encodes a Drosophila receptor.
63. (New) A nucleic acid comprising at least 12 nucleotides which specifically hybridizes to the isolated nucleic acid of claim 57, 58 or 59.
64. (New) The nucleic acid of claim 63, wherein the nucleic acid is DNA, cDNA, genomic DNA, synthetic DNA, RNA or synthetic RNA.
65. (New) A vector which comprises a nucleic acid having the same sequence as the isolated nucleic acid of claim 57, 58 or 59.
66. (New) The vector of claim 65, wherein the nucleic acid is operatively linked to a regulatory element.
67. (New) The vector of claim 66, wherein the vector is a plasmid.
68. (New) A host vector system for production of a polypeptide having the biological activity of an insect gustatory receptor, which comprises the vector of claim 65 and a suitable host.

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69. (New) A host vector system for production of a polypeptide having the biological activity of an insect odorant receptor, which comprises the vector of claim 65 and a suitable host.
70. (New) The host vector system of claim 68 or 69, wherein the suitable host is a bacterial cell, a yeast cell, an insect cell or an animal cell.
71. (New) A method of producing a polypeptide having the biological activity of an insect gustatory receptor which comprises growing the host vector system of claim 68 under conditions permitting production of the polypeptide and recovering the polypeptide so produced.
72. (New) A method of producing a polypeptide having the biological activity of an insect odorant receptor which comprises growing the host vector system of claim 69 under conditions permitting production of the polypeptide and recovering the polypeptide so produced.